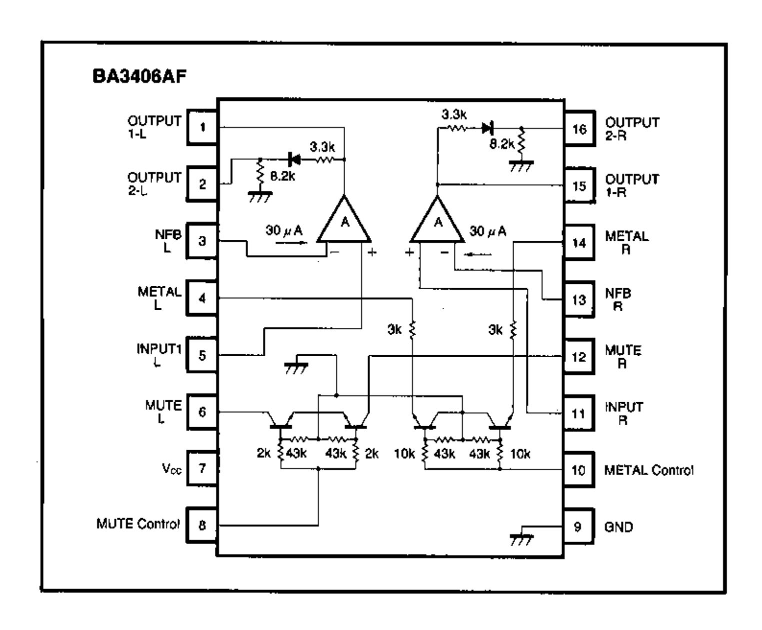
Dual preamplifier with mute function
BA3406AF

The BA3406AF is a multi-function dual-channel preamplifier with a built-in mute circuit and a time-constant switching circuit for use with metal tape. The output circuits have diodes, and can be connected to other circuits in parallel, which eliminates the need for switches. The mute circuit is independent of the preamplifier block, and can be used to mute the whole system.

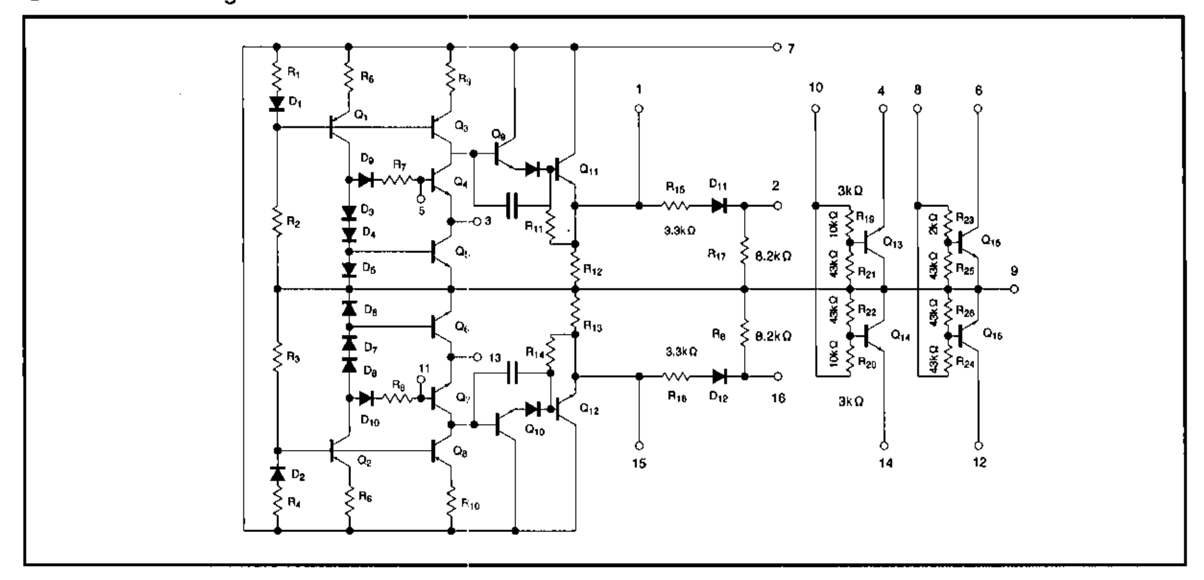
●Applications
Car stereos, radio cassette players, and tape decks

●Features
1) Wide operating voltage supply range (6V to 14V).
2) Low noise (V_{NIN} = 1.0 μV_{rms} typ.).
3) High open-circuit voltage gain (G_{VO} = 80dB typ. at pins 1 and 15).
4) Two channels on one chip, providing good channel balance.
5) Emitter-follower outputs for low output impedance.
6) Built-in switching circuit for use with metal tape.
7) Built-in mute circuit.
8) Mute and metal-tape circuits are independent from the preamplifier circuit to allow greater design freedom.
9) The output circuits have diodes to prevent current backflow and enable parallel connection to other circuits.
10) The resistor for the CR circuit that sets the metal-tape circuit time constant to 70 μS is on the chip. Setting the time constant only requires addition of an external capacitor.

●Block diagram



● Internal circuit diagram



● Absolute maximum ratings (Ta = 25℃)

Parameter	Symbol	Limits	Unit
Supply voltage	V_{CC}	16	V
Power dissipation	Pd	500*	mW
Operating temperature	Topr	−25~75	℃
Storage temperature	Tstg	−55~125	℃

* Reduced by 5.0mW for each increase in Ta of 1°C over 25°C.

● Recommended operating conditions (Ta = 25℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	V_{CC}	6	8	14	V

● Electrical characteristics (unless otherwise specified Ta = 25℃ and Vcc = 8V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Quiescent current	I_Q	−	3.0	4.5	mA	V_{IN}=0V_{rms}
Open-circuit voltage gain (pins 1 and 15)	G_{VO}	75	80	−	dB	V_{OUT}=0.3V_{rms}、f=1kHz
Input conversion-noise voltage	V_{NIN}	−	1.0	2.0	μV_{rms}	V_{IN}=0V_{rms}、R_g=2.2kΩ
Maximum output voltage (pins 1 and 15)	V_{OM}	1.0	1.4	−	V_{rms}	THD=1%、f=1kHz
Interchannel crosstalk	CT	50	65	−	dB	f=1kHz、R_g=2.2kΩ
Total harmonic distortion (pins 1 and 15)	THD	−	0.1	0.6	%	V_{OUT}=0.3V_{rms}
Channel balance	CB.	−	0	1.5	dB	V_{OUT}=0.3V_{rms}
Input resistance	R_{IN}	50	−	−	kΩ	−

●Measurement circuit

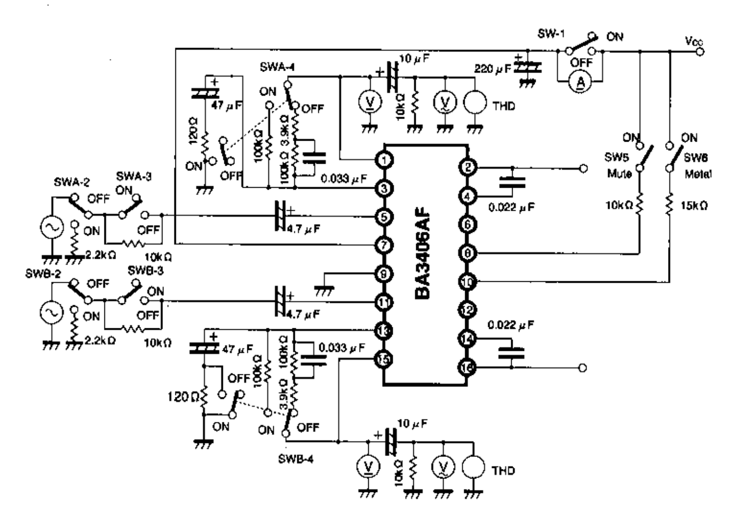


Fig.1

●Application example

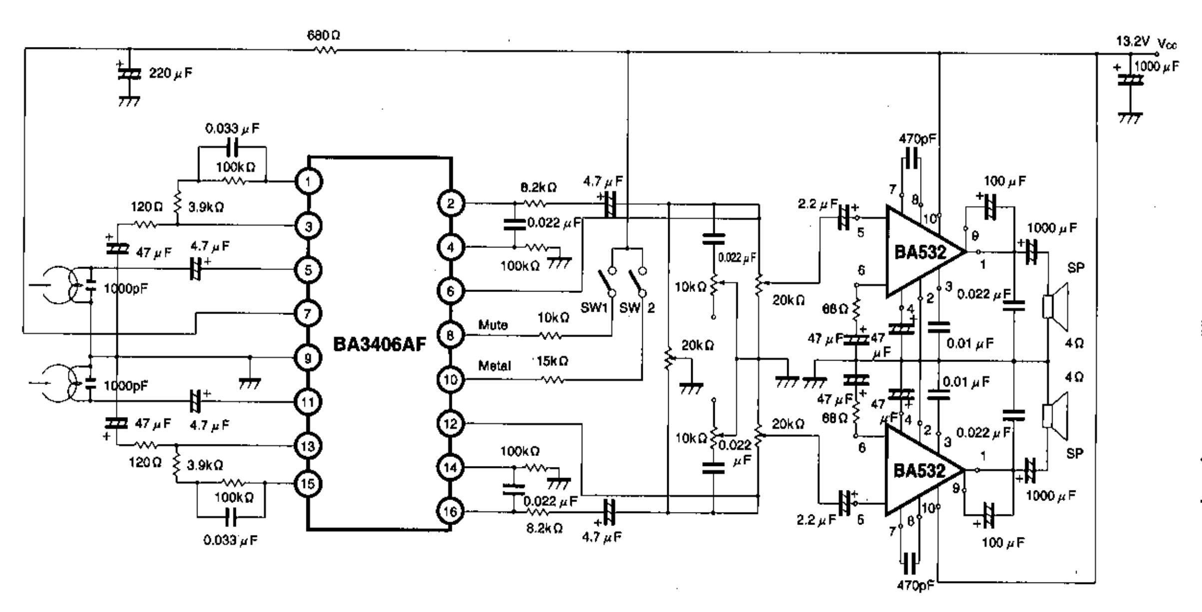


Fig.2

● Electrical characteristics curves

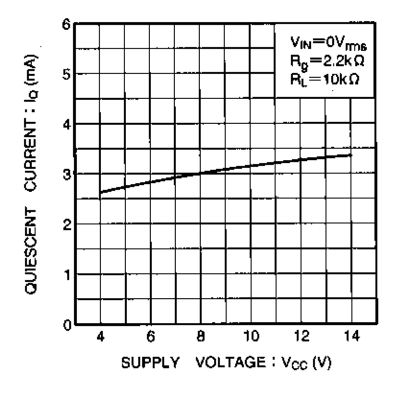


Fig. 3 Quiescent current vs. supply voltage

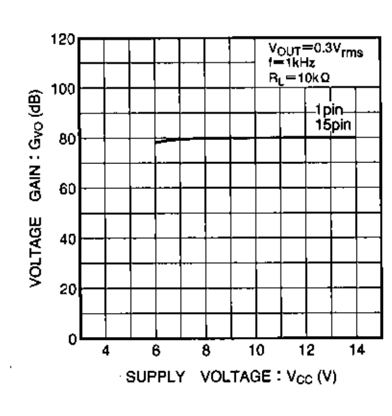


Fig. 4 Voltage gain vs. supply voltage

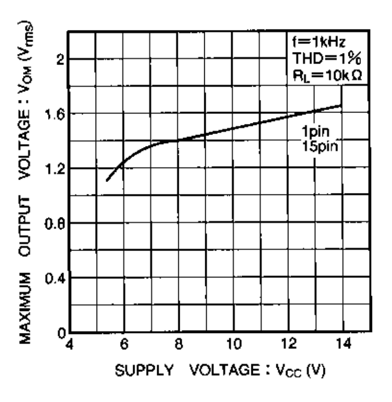


Fig. 5 Maximum output voltage vs. supply voltage

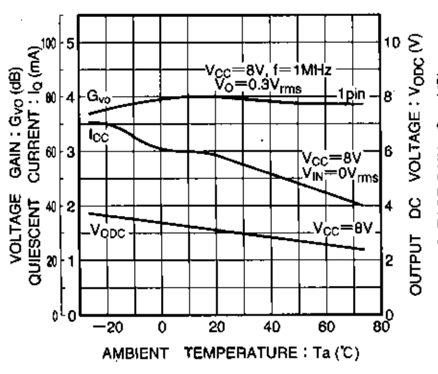


Fig. 6 Voltage gain, quiescent current and output voltage vs. ambient temperature

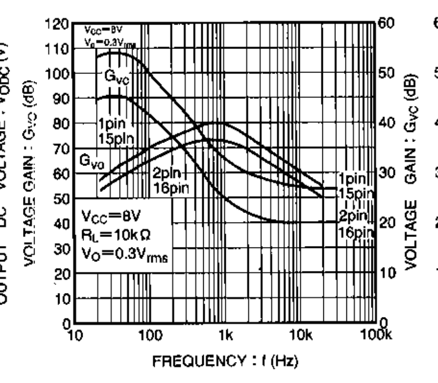


Fig. 7 Voltage gain vs. frequency

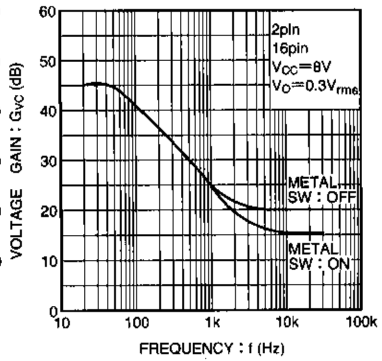


Fig. 8 Metal tape equalizer characteristics

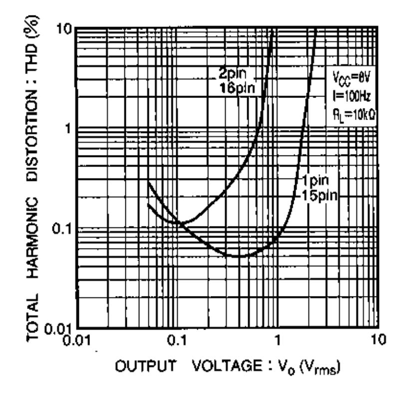


Fig. 9 Distortion vs. output voltage

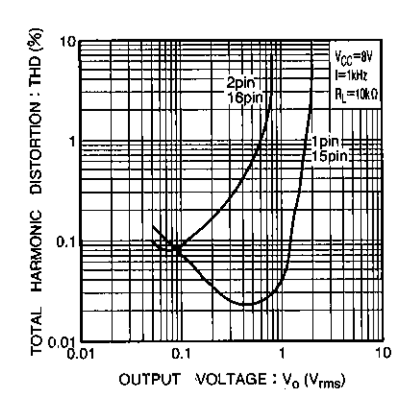


Fig. 10 Distortion vs. output voltage

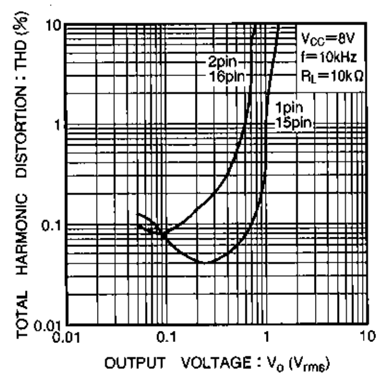


Fig. 11 Distortion vs. output voltage

●Electrical characteristics curves

Fig. 12 Crosstalk

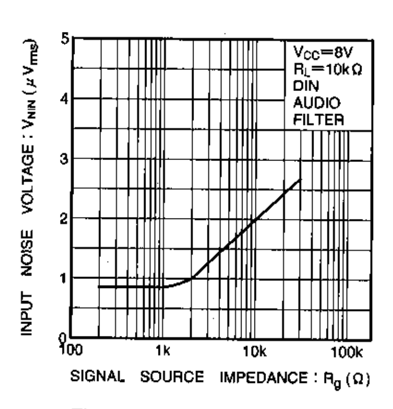


Fig. 13 Input conversion-noise voltage vs. signal source resistance

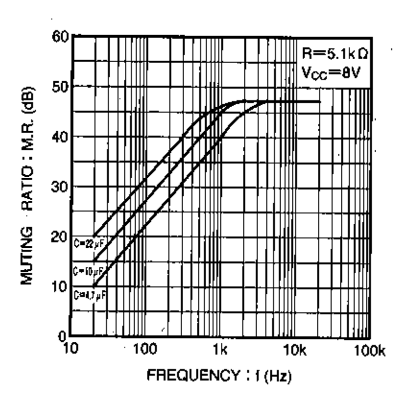


Fig. 14 Muting ratio vs. frequency

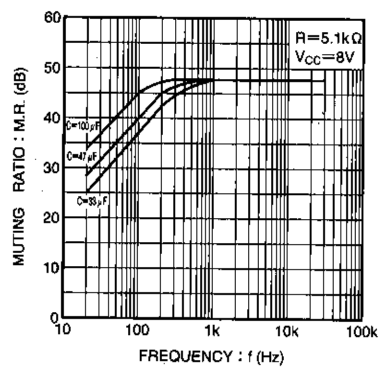


Fig. 15 Muting ratio vs. frequency

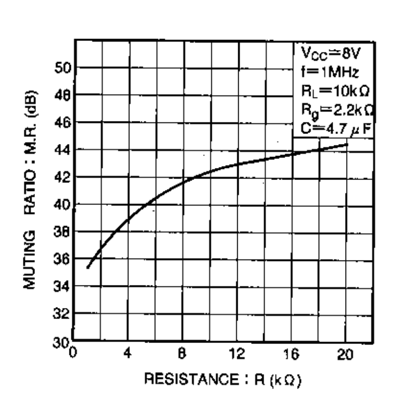


Fig. 16 Muting ratio vs. frequency

●External dimensions (Unit: mm)

